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Institute of the Arts
Visual Arts Graduate Program

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Pamela Wilson

REPORT
PRESENTED IN FULFILMENT OF THE REQUIREMENTS OF THE
GRADUATE DIPLOMA OF ART

ACKNOWLEDGEMENTS

I would like to thank my supervisors, Ragnar Hansen and Johannes Kuhnen for their help and support. I would also like to thank Roger Hutchinson and fellow students for making the workshop a pleasant environment to work in during the year.

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ABSTRACT

The transposition of textile processes into metal: research into the idea that metal can be structured in the same manner as textiles. This has existed for centuries in many different cultures and in my study I am continuing this fascination with techniques which allow jewellery to become flexible and lightweight structures. A study taking the form of an exhibition of jewellery where some of the textural and structural effects in a fabric are accomplished directly in metal or wire at the Canberra School of Art Gallery from February 2 to 8, 2001, which comprises the outcome of the studio practice component, together with the Report which documents the nature of the course of study undertaken.

GRADUATE DIPLOMA CANDIDATE IN GOLD AND SILVERSMITHING

INTRODUCTION

I was born in Australia and gained a BA in Textiles at the C.S.A in 1984. Since then I have been living and working as a freelance textile and jewellery artist in Sweden. I create unique textile works for exhibition as well as working to commission. Most of the work is made on the loom using a mixture of materials including yarns, metal wires, plastic and paper. The use of metal on the loom stems back to early student days when I first did complementary study in the Gold and Silversmithing workshop.

During this years study at I.T.A I am looking for a way of working as a textile/jewellery artist. Sometimes there is some feeling of confusion. Certainty may be better than doubt but creativity is not necessarily inspired by certainty. I want to be open to a range of possibilities.

I work according to whims and pleasure. My jewellery doesn't develop from exact sketches but evolves as I work on it and in dialogue with the materials. I often arrange and re-arrange components until an image or total composition feels right.

Over the last century originality has been a prime goal of artists, continually surprising ones audience and ideally yourself. All you have to do is play and hopefully something unique will happen.

EXERCISES

To familiarise myself with new tools and methods of working a few basic exercises were worked through during the first two months of the course.

1. A raised beaker in guilding metal to practice hammering, annealing, pickling and polishing.

2. A box ring, to practise, measuring, filing and soldering.

3. Making chenier drawing through a metal plate, soldering, shaping.

4. Shaping of stainless-steel wire, bending with templates.

5. Doming of aluminium, copper, nickelled silver.

6. Melting fine silver.

RAISING 1.2 MM GUILDING METAL

Exercise 1

1 Using a piercing saw, saw out 100mm diameter circle.
2. File off the sharp edge
3. Working in a hollow on a wooden stump, round from the outside of the disc half-way towards the centre of the disc with a hammer.
4. Anneal and pickle (in sulphuric acid 10%) rinse and dry.
5. Mark the centre of the disc and draw a circle with a 20mm radius, this shows the base of the beaker.
6. Using a wooden stake as the inside shape, work the metal over the stake with a hammer from the base upwards and around the disc.
7. Anneal pickle between each completed round over the entire metal surface, this process was repeated eight or nine times before reaching the desired degree of tapering on the beaker.
8. Planishing on a metal stake of the same shape using a rounded hammer.
9. As the base was thick but the edges of the base very thin the beaker was placed over the metal stake and hit with a very heavy hammer and then worked on to 'even-up'.
10. Annealed pickled and scratch-brushed, the hammer and planishing marks will appear dull.
11. Start planishing the base from the centre towards the outer edge, then upward from the base to within 3.5mm of the top edge.
12. Planishing with a lighter flatter hammer after checking that the sides are the same as the template negative (1 used a 'T' square).
13. Hammer the areas, which appear low to expand the metal. Check the inside is completely flat and smooth and correct by hammering the outside.
14. Using a wooden stake the same shape as the beaker cover in 220 emery paper and place on the disc-sander so that it is rotating towards you. (Note the direction of the glued seams of the emery paper) Emery inside the beaker until completely smooth.
15. File the outside surface to remove any ridges.
    (a) a rough file, (b) size 2, (c) size 4, (d) emery 220.
16. Use a fine emery paper on the base as otherwise the edges tend to round.
17. Saw-off the top at an angle and file with a long course file and then size 4. Remove the sharp edge with a beveller.
18. Scotch-brite the inside of the beaker by gluing strips onto a wooden shape.
19. Start work on the outside of the beaker going over it with
    (a) 600 emery paper
    (b) Tripoli on the polishing machine starting at the bottom from the inside, outwards. Then working on the outside in a cris-cross motion until the last time, which should be done lengthways along the beaker.
20. Wash in warm soapy water with a drop of ammonia and dry.

A BOX RING

Exercise 2

The Design had to:-

(a) incorporate sharp edge

(b) joining the inner ring at two points

1. Take the diameter of the inner ring and find the circumference.
2. Using nickelled silver cut the length and width for the inner ring.
3. File all the edges square and using the rounded pliers shape into a rough circle joining the two ends.
4. Solder using hard solder.
5. Pickle and round the ring on a mandrel and remove the excess solder with a rounded file.
6. Take two mandrels, one for shaping and one for measuring the ring size. Use a rounded hammer and hit the middle section of the ring changing sides after every round. Check the size until reached. (I noticed the result was the opposite of what I imagined should happen, and took this into account).
7. Mark out the angles on the outer ring and scribe a line at right angles to the length.
8. Saw along this line half way through the metal strip:-
   (a) using a triangular file
   (b) using a square file
   for a soft curve file only a third way through
9. Anneal this strip before filing, bending and soldering. When soldering always give support to the rest of the ring as it may move when heated.
10. Pickle between solder and saw/filing jobs
11. Taking the inner and outer ring shapes, these are soldered to a flat sheet of nickel silver. This is cut a little larger. Position and mark the inside edge with a ball punch.
12. The pieces of medium solder are placed on the outside edge with borax. The entire piece is heated at once until the solder runs.
13. Take the second piece of sheet metal and cut out the ring hole after marking it with a ball punch and anneal and pickle.
14. Position and solder when the first piece has been filed flat.
15. Trim and file the whole ring except for the flat outer sheets.
16. Emery 220 inside the ring using a flexi drive, working towards you on a curve.
17. Use tripoli on the polishing machine, move cross-ways. Finish off in one direction lengthways.
18. Wash in warm soapy water with a drop of ammonia and dry.

When looking at the two pieces made they seem very hard, shiny, flat and impenetrable. They felt very different to my usual work, which is lighter, softer and more transparent. I enjoyed the feeling of having shaped a hard material and the form being fixed. This was a new sensation.

3 SILVER BROOCHS

I felt the surface needed a variation in texture. As silver is so soft it would be possible to roll an imprint into the surface. So as a kick-off from the box ring I decided to make three brooches but hopefully not so 'boxed-in' and tried to open up the shape a little. The next step was to gather all my off-cuts (scrap metal) from the ends of my warp from previous work on the loom, consisting mainly of .30mm fine silver wire which was then cast with a little copper to make a 925 silver alloy.

Casting in water

The silver scraps are placed in an open crucible with a small amount of borax of flux and heated with a large flame. When the metal is properly melted the silver is poured into an ingot. In this case the ingot or mould was a copper form covered in a cotton fabric which was placed in a stainless steel container filled with boiled water, (this was to slow down the cooling process), the result was a silver rounded pebble 7cm x 1.5cm.

Rolling

1. The silver was hammered to the thickness of the space in the rolling mill.
2. Rolled through, annealed, pickled and dried with a flame (so as not to mark the roller). Hammered to widen.

The result was a length approx 18cm x 2cm which was then rolled to flatten out the hammer marks about 10 times and scratch-brushed to remove oxides. Annealed, pickled and scratch-brushed and dried with a flame. Now the silver is 40cm long and 2.5cm wide in the middle, tapering to 1cm at both ends.

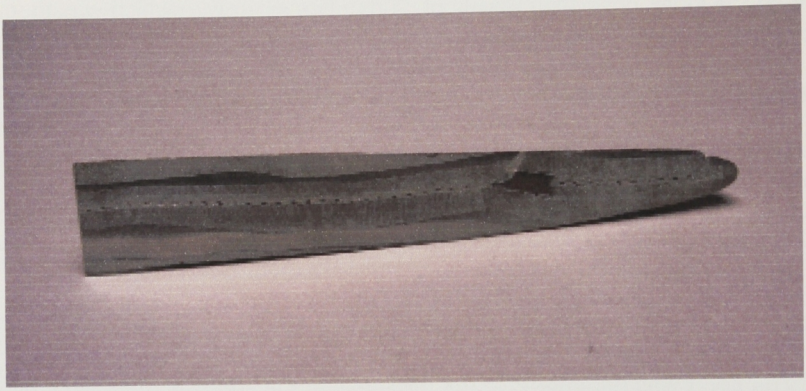
Printing

To make an imprint on the silver length I used fine stainless steel mesh. Two strips sewn together with a nylon thread and the two edges were folded over twice to produce a line and a deeper imprint. The nylon threads split in a couple of places, which gave an interesting open area with a flat surface. This silver length was then cut into three lengths, which determined the three general shapes of the brooches.

Assembling the Brooches

Using a piece of long-rejected .05mm silver sheet I cut and folded three slightly different shapes.

1. A 1.5cm wide piece of silver was folded with a 45% angle. 5cm in from one side making a triangle once the printed piece of silver was soldered onto the front.
2. A 2cm wide back and two 90% angles folded along each side. The printed length was curved and soldered between the two sides.
3. A long tapering shape with a flat front and back and open ends.



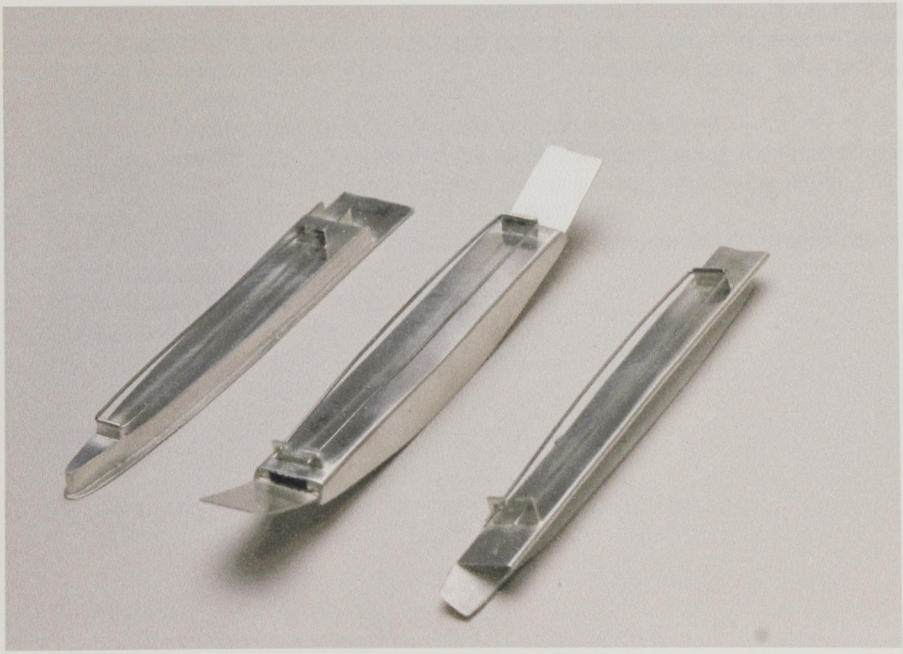
Making the Brooch findings

Using a chenier and a 1mm sheet strip of sterling silver. The chenier was to be drawn down to take the .9mm stainless-steel wire to be used as the pin.

To make a chenier .9mm measure the size of the tube needed. Multiplying the diameter by 'py' to find the circumference. For example Dia 5m = 17mm (to allow for filing)

1. Cut to shape.
2. Heat and pickle.
3. File the edges.
4. Close and draw through the mill.
5. Tap the tube close together using a hammer.
6. Borax the seam.
7. Solder together using hard solder.
8. Clean up the joint with a file and pickle.
9. Emery the surface and draw to the appropriate size.
10. Anneal when necessary.

To straighten a curved chenier solder a plate to the end and draw it through the mill.



When making a square chenier, use a square copper wire inside the silver one to stop the sides caving-in.

Solder the chenier onto a 1mm sheet strip which has a groove etched into the bottom edge. The solder is pre-melted and the excess filed away before being soldered to the back of the Brooch.

The sawn sheet must be cut allowing the pins to lie parallel to each other and then soldered to the back of the Brooch. The pin is then bent into position through the chenier and the tips filed, emeried and polished.

To finish these Brooches it was necessary to file and emery the surfaces to remove 'fire scale' which appears as a bluish tinge when the pieces are held in a shadow.

Emery paper 220 x 600 then use scotch-brite moved over the surface in a circular motion to give an even matt finish.

These three pieces were annealed and pickled about three times to bring the fine silver to the surface and finally scratch-brushed.

This was a major feat in soldering for me and I found the findings so small I could hardly hold them in my fingers. I now understand that .1 of a millimetre is a 'mountain' and over heating for a split second can totally ruin a piece.

I was pleased with the surface being broken up by the imprint and the contrast of matt and shine. The small open areas in the shapes gave them a feeling of lightness although they were quite big and would need to be worn on a heavy knitted or woven fabric. I think their 'whiteness' added to their feeling of size and at this stage I was eager to use at least one other colour in the work.

ANODIZING

After a seminar 'Zero Craft 00' at the National Gallery of Australia and Susan Cohns exhibition as well as Johonnes Kuhnen's talk on 'The Madness of Anodising Aluminium, also at the N.G.A I was encouraged to try dyeing aluminium.

Because of its softness it was also excellent to make an imprint when rolled through the mill this meant I could combine surface texture, line, simple shaping and colour but not solder.

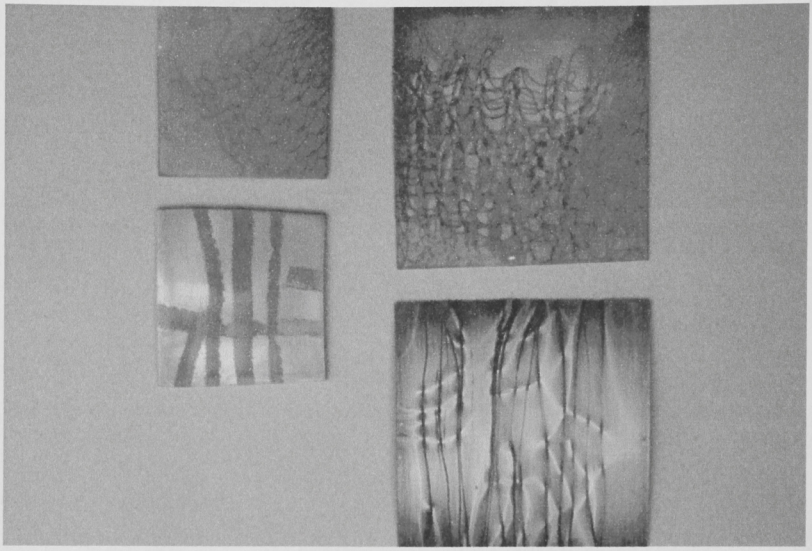
Test pieces using 2mm thick aluminium sheet.

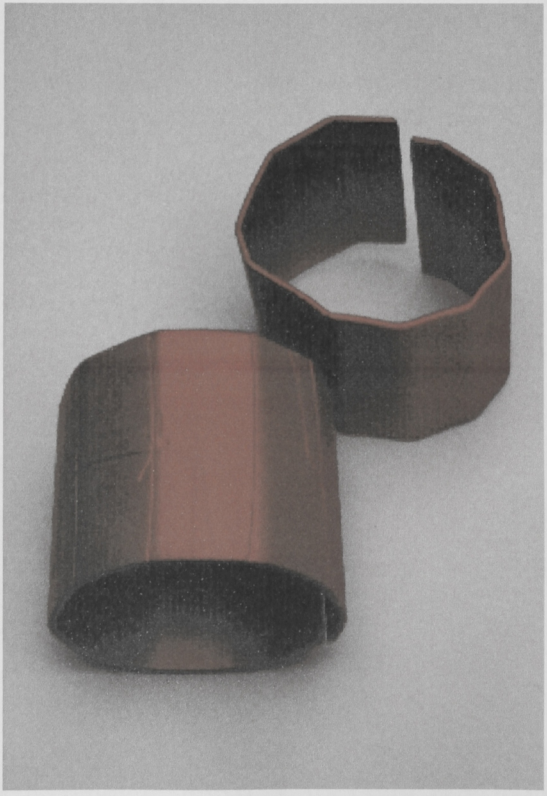
(a) Print with stainless steel knitted tube.
(b) Copper wire to produce lines.
(c) Shaping the sheets into armbands by folding.
(d) Printing using several metals shapes.

Method

When anodising, because of all the chemicals and acids used in the process, it is important to use goggles, protective aprons and gloves.

1. The piece must be completely finished before being anodised and with good contact attached to an aluminium holding-wire, which is connected to a bar.
2. Immerse the piece in the caustic bath for 30 seconds – 3 minutes. (depending on the surface required).
3. Rinse in cold water.
4. Rinse in Nitric acid to neutralise.
5. Rinse in cold water.
6. Immerse in the sulphuric acid bath heated or cooled to 18-20∞C.
7. Attach the wire carrying the current to the aluminium bar holding the finished pieces.
8. Leave for 1 hour at 12-15 volts depending on the surface area of the work.
9. Remove from the sulphuric acid and rinse in cold water.
10. Mix the dye and heat to 45-50∞C and immerse the work for 5mins or less depending on the strength of colour wanted.
11. Boil in distilled water for 1 hour to fix the colour.
12. The dye is re-used.





ANODIZED ARM BANDS

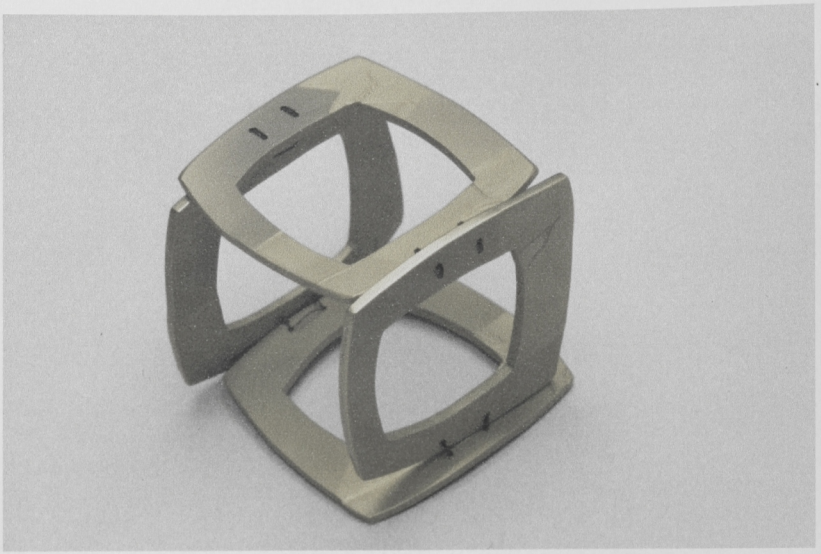
A series of bracelets using folding to shape and cutting out pieces to open-up the form. Finally 1 cut out individual rings, sandblasted the surface and printed rings at the centre of each individual ring front and back and dyed them different colours. Voila! 'The Olympics' and a piece photographed for the Hanau Catalogue 31 @ 20.

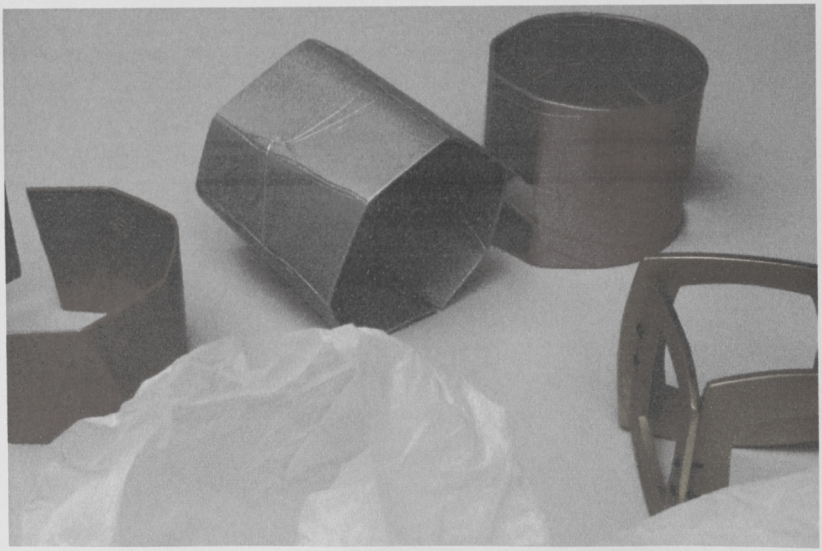
A contrast in surface can be achieved through polishing or sandblasting the aluminium surface. The caustic bath removes some of the shine, so that the time in the bath can be shortened according to the desired finish.

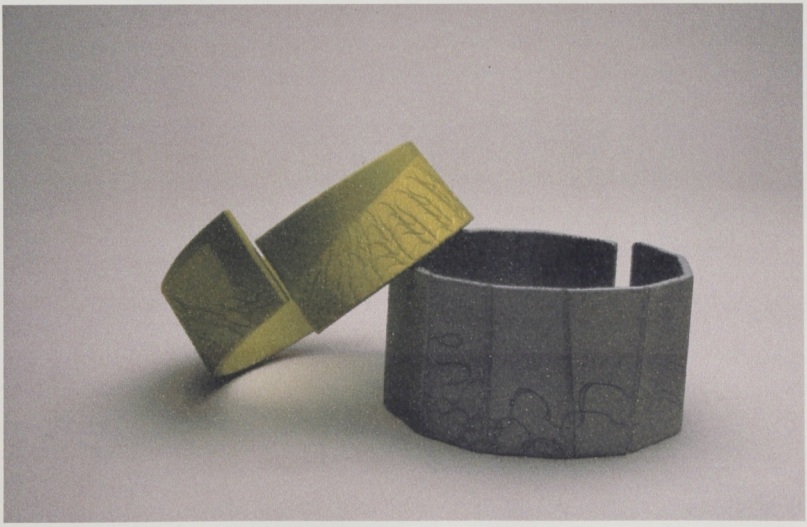
Locking Mechanism for the 'Olympic Bracelet'

Using delrin and aluminium, this was shaped on the lathe. The thickness was decided and the circles cut out roughly on the bandsaw. A 6mm hole was drilled in the centre of each circle and fixed into the lathe to round-off. The chuck was locked using the exterior set up and the grooves were made to take the sliding aluminium locking device. This was done using a chisel shaped tool.

The chuck was then reset with the interior set up to remove the inner material, leaving a 7mm inner wall. The aluminium is cut from a pipe to the same width as the groove in the delrin, which has the same thickness as the wall of the aluminium pipe. It is sawn to open and anodised black and stretched over the delrin disc to fit snugly but still being able to be moved around to the matching opening in the delrin disc.







THE CHAIN

This led me to look at 'the chain' in general, this time reducing the size of the discs. I used the inner off-cuts from the two Olympic bracelets, filed around the edges and cut a new inner circle away. These were printed in the rolling mill to distort the shape slightly with a wiggly line printed on both sides using fine stainless steel wire.

'Pebbles on a beach' not quite round but soft looking and the imprint gave the impression of a fishing net.

The fascination with the primitive is especially resonant as society becomes increasingly techno-oriented. Human psyche seems to need to be connected to physical matter as well as the internet. In response to a cold clean minimalist style there is a desire for tactile, exotic and sensual materials and for colour interplay.

With the use of many colours, lines and textures, I was interested in the visual effects of simultaneous contrast. It is an essential point that the effect of a colour is determined by its contrast to other colours. A colour should always be considered in relation to its surroundings. In this piece I tried to show a vivid harmony by varying the colour between cold and warm, light and dark and dull and intense. When using different colour combinations individuals differ in their judgements of harmony and discord.

For example, often colour combinations are called harmonious because of their similar chromes or different colours in the same shades. Combinations of colours that meet without sharp contrast referring simply to an agreeable/disagreeable or attractive/unattractive scale. These are personal feeling without objective force.

Harmony implies balance, symmetry of forces. My approach to colour varies, depending on the intention of the piece. The three directions being visual, emotional and sometimes symbolic.

Once the eleven 'pebbles' were dyed, half of, which had been sawn open for linking, the subject of wearing had to be solved. It was then decided to make a bezel for the inside edge of the anodised discs.

Making the bezel

Using scrap fine-silver to make a long flat band. This was done in a small crucible with a small amount of borax or flux. When the metal is properly melted the silver was poured into the mould. It was necessary to warm and grease the ingot beforehand to prevent the silver from sticking to its sides. When the silver had been cast into a small bar it was rolled through the square wire roller to 2.5mm. Drawn through a round plate in the mill and flattened to .5mm and approximately 3mm wide.

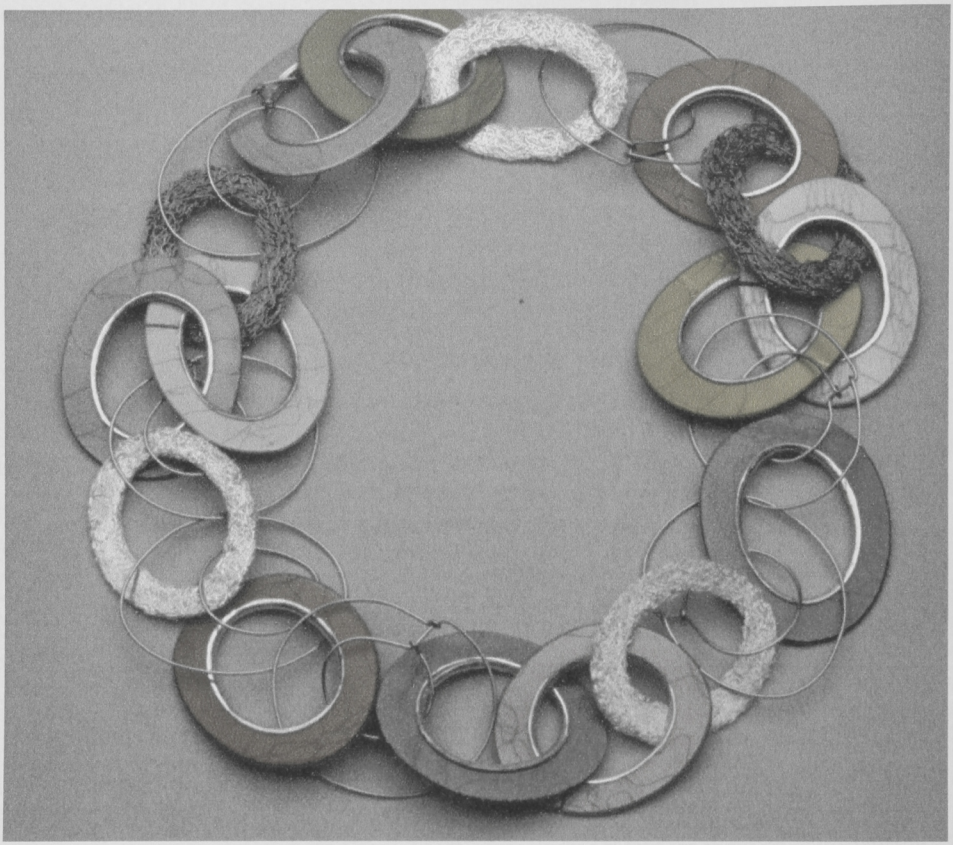
Method 1

To fix the silver bezel inside the anodised aluminium disc the silver band was cut to fit snugly into the disc and soldered. Aluminium 'rest' for the piece to sit in with the same sized hole as the disc. Then using a repousse hammer and a steel tool tapped lightly around the edge. The piece was turned over and worked on from the other side of the bezel, then using a slightly heavier hammer the silver was tapped down further over the aluminium and burnished to give a polished line.

Method 2

This proved to be a good solution as method 1 needed two people and it was difficult to fold the silver evenly on both sides. The .05mm fine silver band, soldered to fit inside the aluminium disc was placed on a steel rod with a slightly smaller diameter than the aluminium disc;

1. This was fastened in a vice
2. A groove was filed in the rod.
3. Using a soft hammer (made of resin or plastic) the disc was tapped all the way around so that the silver was forced up evenly over the disc.
4. Then a second, deeper groove was filed in the rod and the process repeated forcing the silver further over the disc.
5. Then using a slightly rounded steel hammer the silver bezel was hit gently on a steel cube flattening it more.
6. The silver bezels had been emeried first with 400 paper and again after shaping a finer grade emery and then burnished to finish. A few of these discs had been sawn-open before so the silver bezel was then cut through to allow linking. These were combined with knitted silver discs and stainless steel wire.



GRANULATION

A natural step after using fine silver as a bezel to stop wearing would be to make a link using only fine silver. Instead of using the print of the knit on the disc, use the actual knitted metal compacted into a link.

One problem was that the compacted silver wire was still too loose and could catch on fibres when worn on a piece of clothing. A granulation technique for stabilising the wires was suggested as soldering would be impossible to clean and would be visible. The knitted tubes were first compressed in a hydraulic press in the shape of a ring 4mm thick. These were then bent by hand into an oval and pressed through the rollers. This was repeated twelve times, each link becoming 4.5cm long and 3.5cm wide, the inner hole is 3 x 2cm.

Granulation or fusing without solder

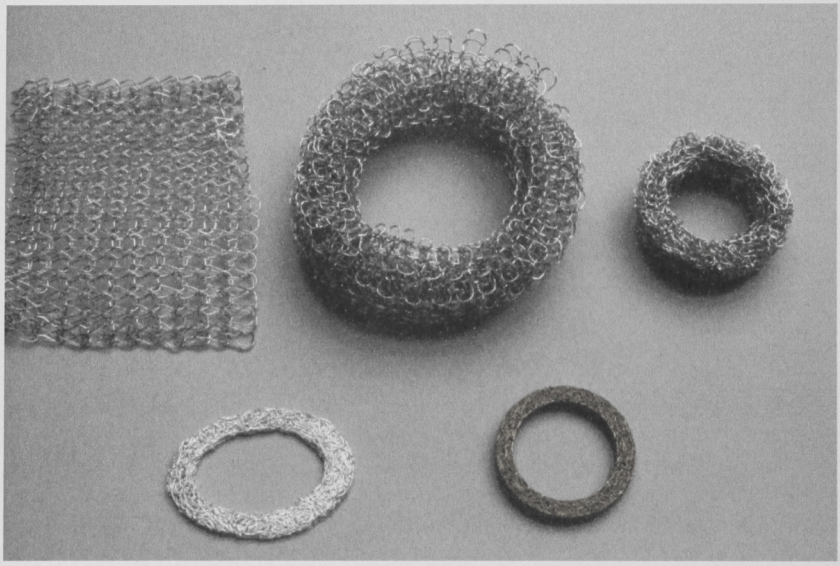
From Latin granulun, diminutive of darnum 'grain' is a metal work process usually joining small balls or granules to a base. The same process can be used to join granule to granule, granule to wire, wire to wire, chip to sheet, wire to sheet, sheet to sheet. This is accomplished by fusion welding bond, the process works best with gold but can also be used with silver.

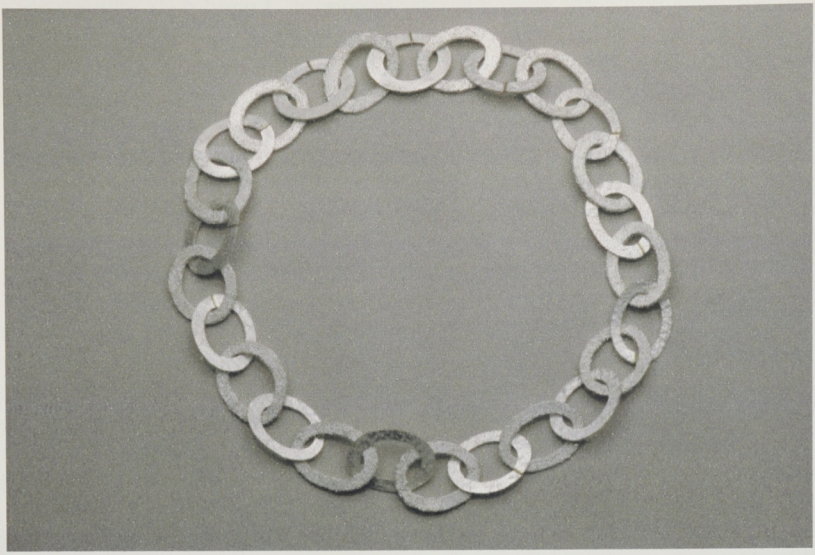
The Theory

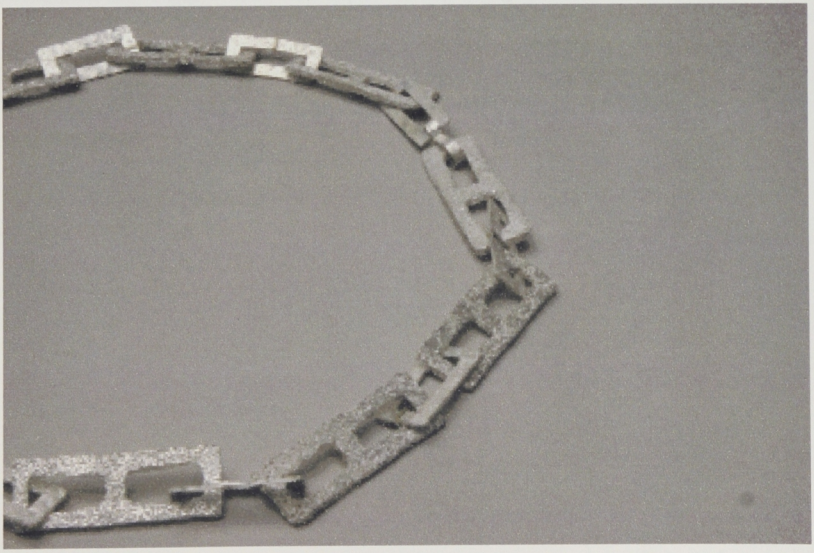
The ability of metals to be welded is influenced by their metallurgical, chemical, physical and thermal characteristics. The welding implies that the surfaces are joined in a molten state and the fusion implies that an interpenetration of atoms occurs. The surfaces are heated to plasticity and the metal surface atoms become mobile. The atomic structure of the molten metals in contact breaks down, opens up and interacts. Copper, the joint alloying metal used in this process, penetrates the metal (in this case silver) in both directions. This localised alloying is characterised by intermolecular penetration. This fusion happens at a temperature lower than the separate melting points of the individual component metals being joined. The presence of carbon also helps to reduce the melting point.

To make the join the piece of melted silver wire is coated with a combination of copper and an organic binder. I have used either a copper salt CU (C2 H3O2) cupric acetate or copper plated the pieces.

It is also essential to use a colloidal organic binder in the process for mechanical and chemical reasons. Mechanically the binder adheres the granule to the surface or to other granules. My wires were so tightly pressed together that in this case it wasn't necessary to adhere the surfaces.







Animal or fish organic glues or vegetable gums are colloidal substances. The fact that carbon is produced when gums are heated is very important. I used gum-arabic after trying common wallpaper paste as it is cellulose but it must have an anti-mould agent added as it reacted by becoming globular and didn't run into the cavities in the matted wire.

I have applied these two solutions one after the other but they can be mixed with distilled water and made into a paste, which is then applied.

The entire work is heated with a reducing flame until the copper compound forms an oxide, which the glue carbonises. The carbon of the glue combines with the oxide of copper and passes off as carbon dioxide, leaving a thin molecular layer of pure copper. This film combines with molecules of silver form the joining surfaces of the wires to form a strong, delicate bond.

I found it necessary to repeat the process several times to achieve rigidity. Several experiments using a finer wire failed to work as the piece became very brittle and crumbled after several attempts of fusing the delicate wires together. These ovals were linked together by additional links sawn out of 2m silver sheet, which had been rolled with the imprint of stainless steel knit. These were soldered together again after inserting a piece of 1mm gold band.

Making the gold band

1. Melt gold with borax and pickle (a piece the size of a large pea).
2. Holding with tweezers roll through the square wire rollers.
3. Using a hammer/reshaped when a groove appeared.
4. Heat and pickle.
5. Roll flat to .5mm.
6. Using flux, pre-melt solder onto the gold band and position the three links and piece of gold before heating.
7. Heat so that the solder runs evenly along the four lines.
8. This was repeated thirteen times until the chain is complete.
9. Anneal, pickle and scratch-brush to finish the surface.

On four of the links the solder had run onto the printed surface. Filing this away would have been impossible without damaging the surface and electroplating the yellowish patches of solder was tried.

ELECTROPLATING

(Using a brush application granide solution)

Negative cathode attached with copper wire to stainless steel and cotton wool.

Positive anode joined to the silver chain.

Plated at 5 volts, the current density varies according to the load and cathode bar.

It worked well depositing a thin layer of silver on the spots of solder, which was then rinsed and scratch-brushed.

This technique is used again on the following two bracelets where the surfaces were covered in copper before applying the gum and heating. This technique is used again on the two bracelets described below. A thin layer of copper was deposited covering the surface of the silver bracelets by electroplating before covering in gum-arabic and heating.

Electroplating with copper

Make a tank out of plastic storage bottle (no metal as it corrodes with acid)

1ltr of water.
50mls sulphuric acid (add acid to the water stirring all the time).
224gms cupric sulphate.

(a) Shape a copper U with extended length to hook over the 'tank'.
(b) Attach the silver piece (bracelet) to the cathode (-)
(c) Attach the copper U sheet to the anode (+)

6 volts – 18 amps at 18°C for 3 minutes.

It is important that the piece does not touch the copper plate. 2nd attempt. 3 volts 9 amps 1 minute.

The surface was well covered in copper and then gum-arabic and heated but the fusing didn't seem to be working.

(a) gold flux used and heated again.
(b) Silver brazing flux No. 2 and heated.

Assembling of the bracelet

1. A flat circle of fused fine silver wire.
2. A flat circle of knitted iron blackened with linseed oil.
3. A sterling silver bezel joining the two.

Making the bezel, version 1

1mm sterling silver sheet rolled to .4mm cut to a 14mm width and folded to an 'L' profile and then rounded on a mandrel. Cut to fit firmly inside the bracelet. When this first bezel was pressed down on the 2 pieces of knitting the solder joint split this was refiled soldered and pickled and the excess solder removed, the joint was still bad and the process repeated. This time the excess solder was filed away and the metal became thin. After the third solder job with a new piece of sterling silver I worked on the same procedure except for positioning the band upright on the pumice and used soft solder. This time a ledge appeared after soldering and was hammered flat on a steel stake, emeried to even up, annealed and pickled and finally scratch-brushed.

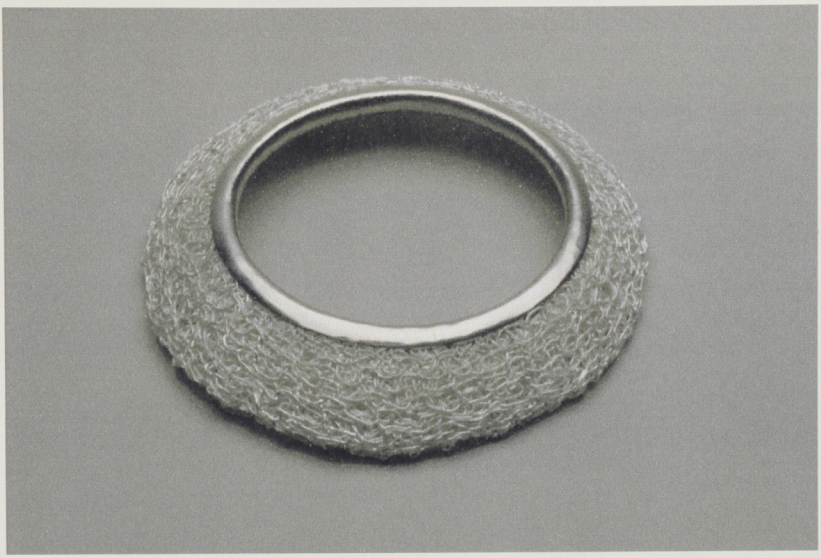
To shape the silver bezel around the two knitted circles the 'L'-shaped lip rested on top of the conical circles and pressed slowly onto a wooden block with a hole in it. The pressing was finished off with a dome shaped steel stake on the underside.

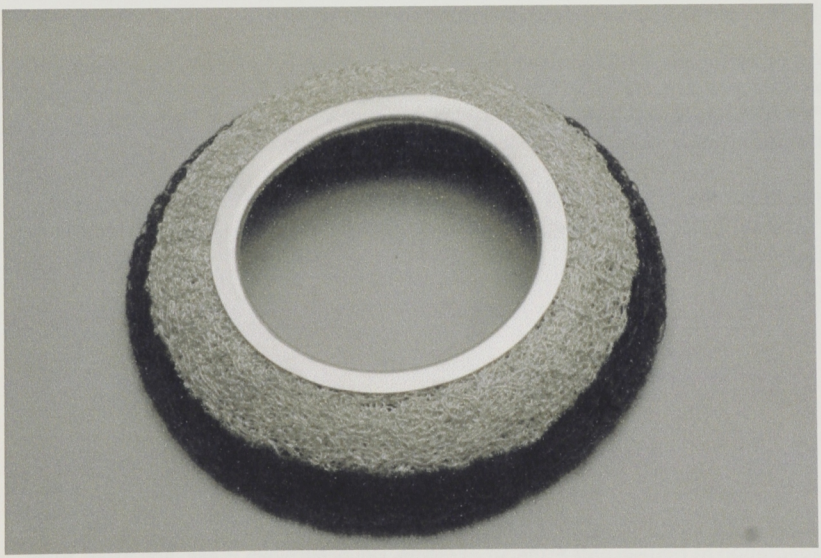
Bracelet No. 2

Fine silver-knit shaped to a conical flat circle. Granulation technique repeated three times for rigidity.

Making the bezel, version 2.

1. Cut a .5mm thick length to fit inside the circle 12mm wide.
2. Solder form the outside as it becomes the inside once shaped.
3. Clean up with an ellipse shaped needle file.
4. Shape round on a mandrel.
5. Using a domed stake hammer a ridge around the lower centre with a long narrow shaped hammer about three times.
6. Turn the piece over and use a planishing hammer on a wooden surface to produce the 'L' profile.
7. Anneal and file the edge.
8. Re-shape on a mandrel, anneal, fine emery and scratch-brush.
9. The silver ring is placed inside the knitted shape on a wooden block with a conical steel stake inside.
10. Hit lightly with a hammer to press the silver bezel down over the knitted circle.





FINE SILVER AND STAINLESS STEEL BROOCH

a) Granulation technique using gum-arabic and copper acetate.
b) Five double layers of stainless steel knit, which was rolled through the mill.
c) Silver sheet to hold the findings for the brooch and to give extra stability.
d) Drilled six holes two 1mm holes to hold the brooch pin and hook and four .6mm for links to hold the 2 meshes together.

Five double layers of fine silver knitted wire were stitched at the edges and flattened through the rollers. Where there was less thickness at the edges the openness gave a lacey appearance and a fragility, one of the inherent qualities of textiles.

I am as many others working in arts and crafts interested in the basic form-generating processes of nature. Not only the forms and structures of nature but on the inner logic and information coding of D.N.A and patterns seen in the development from a cell to an organism.

To approach design in an evolutionary manner comes easily to a textile designer as weaving and knitting in particular can show an example of the direct result of the combination of a code and the resulting fabric. It is possible to evolve surprising new designs and that developmental and evolutionary processes are of interest.

> "Weave and knitting can be understood as a cellular automata with the state of each crossing warp over weft or weft over warp as the state of a cell. Successive rows of the weave or in this case knit are both literally and logically successive states of the automation, so each row of knit is dependent on the row above and on transition rules. The technique for evolving a design requires the characteristics are coded and then subject to very small random mutations".[1]

> "Groups of designs are developed and the most successful are selected for further development. Selection can be on the basis of the most efficient designs (emulating natural selection) or on aesthetic or other criteria (more comparable to breeding show dogs)".[2]

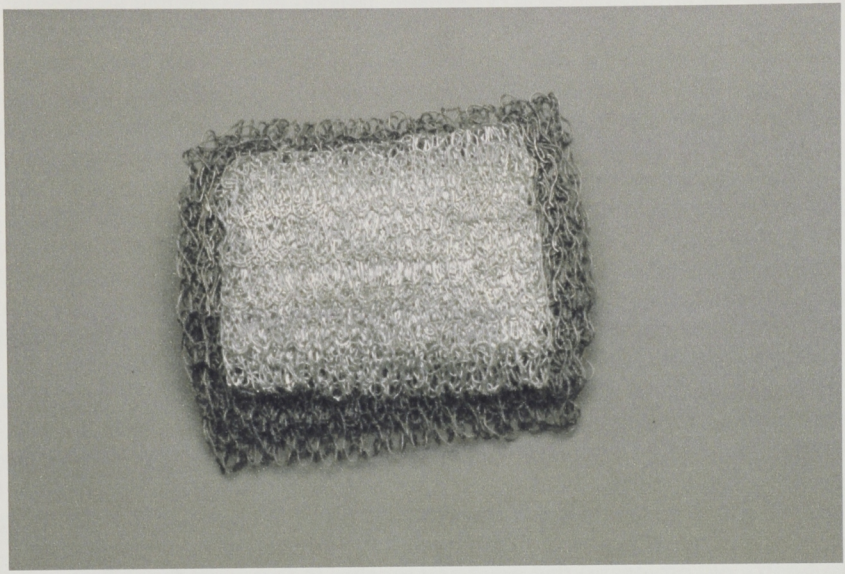
> "With weave or knitting the medium tends to be the message. The data in the pattern is the paternal intellectual conceptual data model in the computer and the material is the maternal embodiment of the pattern in the woven or knitted fabric. In the case of weave or knit the date is physically embedded in the structure of the interlacing. Patten and material are one".[3]

I am constantly fascinated by the technological developments in the production and designing of textiles. Cloths as strong as steel and metallised fabrics as soft as silk are being produced.

[1] Holland, JH, **Adaptation in Natural and Artificial Systems**, Uni of Michigan Press, Ann Arbor 1975

[2] Frazer, JH **Data Structures for Rule Based and Genetic Design in Visual Computing Integrated Computer Graphics with Computer Vision**, Springer-Verlag, Tokyo 1992 pg 731-744 both sited in **Textile and New Technology**, O'Mahoney and Braddock

[3] **Textile and New Technology**, O'Mahoney and Braddock



Textiles has a fragile quality but here it would be seen as a contradiction because the materials used are of silver and stainless steel with their feeling of sterile, perfection and slickness. This combination was simple but affective visually depending only on the patterning of the knitted metal. Although the patterning in the two materials used is identical the quality and colour differ.

The mixing of materials is very common in jewellery making today but this wasn't the case 40 years ago.

The shift from using mainly gold in jewellery was first seen in designers of the Northern Countries of Europe and Scandinavia during the 50's. Scandinavian jewellery was clear, sculptural and expressive using mainly silver, partly because of tradition but also the comparatively low cost of this metal. These new forms were large and would have been too expensive in gold.

In a similar way stainless steel has been incorporated in jewellery many years later. Unlike silver, gold and platinum, stainless steel isn't a naturally occurring metal that has been mined for centuries and therefore a part of human cultural history. It's an industrial material of the 20th Century. Ever since it's daring debut steel has been successfully used in designer jewellery and has achieved 'Salon Status' in the world of product design. It's main attributes which have contributed to the materials popularity are that it is practical utilitarian and has a lasting non-tarnishing shine. The introduction of steel into jewellery making was a ideological statement which suggested that jewellery acquires its value not from the use of costly materials but form the way it is crafted in a contemporary way. This approach to material and form permeated the thinking of Freidrich Becker (Johannes Kuhnan's old professor) this artist and teacher in Dusseldorf was first an engineer. The sculptures and pieces of jewellery by Becker, the artist however clearly demonstrate his training as an engineer. He invented Kinetic jewellery as well as a technical aesthetic into the work of jewellery.

Ron Arad founded in 1981 the design Company 'One-off' with Caroline Thorman. They produced in '92' a metal fabrication of woven steel. For the first time steel not only appeared soft but actually behaved like a fabric. For example 'Loop-Loop' is an endless strip of herringbone double weave steel welded to two steel profiles without any additional structure.

I enjoy using this material as it is an unpretentious industrial, unromantic, no-nonsense alloy.

Rumpelstilskin who helped the millers daughter spin straw into gold has been replaced by a whole network of alchemists from very different disciplines, all working together to create different materials or alloys more precious even than gold.

CONCLUSION

During the nine months spent in the gold/silversmithing department which has passed so quickly, I have learnt new methods of combining my textile work with Gold and Silversmithing techniques which will help me in my endeavour to make functional jewellery.

As Chaucer put it "The lyf so short, the craft so long to lerne".

The body is like a moving gallery with its torso as blank walls. Hooks and ledges, are the fingers, wrists, upper and lower arms, ears, neck, hair and ankles. Jewellery becomes linked with the wearer's identity with their view of themselves and with how other view them. The way they move and display themselves is not only a matter of biology and physics but also a psychology of wearing unconventional objects. I'm not interested in mass appeal as that is for industry. Jewellery made now is a product of the culture of individualism. There are shared values but they tend to be shared between individuals within minorities rather than in crowds.

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Born in Sydney, Australia.
Educated at Canberra School of Art, Australia.
Lived in Sweden since 1987.
Member of Metallum, a gold and silversmithing co-operative, with its own gallery in Stockholm.
Member of Konsthantverkarna, Stockholm.

EDUCATION

1976-77 1-year Art course, Hantverkets Folkhögskola, Leksand, Sweden

1981-84 Bacholor of Arts (Visual) Canberra School of Arts, Canberra, Australia

SCHOLARSHIPS

1990	Konstnärsnämndens Scholarship, Sweden
1995	Konstnärsnämndens Scholarship, Sweden

EXHIBITIONS (solo and group)

1980	Craft Council Gallery, Canberra, Australia
1983	"This years model", Bitumen River Gallery, Canberra
1984	Final Year Students Exhibition, Canberra School of Art
1986	"East-West", Contemporary Jewellery Gallery, Sydney
1986	"Textiles", Gallery 41, Canberra
1986	Tamworth National Fibre Exhibition, Selected for the travelling exhibition which was shown around Australia
1987	"Extex", Cuppacumberlong Art Gallery, Canberra
1988	"New members", METALLUM, Stockholm
1989	"The Ear in focus", Galleri Perspektive, Oslo
1989	One man exhibition, Atelje 585, Helsinki, Finland
1989	Textile exhibition, Konstföreningen Hallska Gården, Gränna, Sweden
1989	"Ydre artists", Österbymo, Sweden
1990	Christmas and New Year Exhibition, Konstcentrum, Gävle Sweden
1990	Selected to represent Sweden in "Design in Sweden in the 90's", travelling exhibition in India organised by FORM

1990 "Candle holders", METALLUM, Stockholm
1991 "Decorate the Ear", METALLUM, Stockholm
1991 "Metallum 10 year Jubilee Exhibition", METALLUM, Stockholm
1991 "Metal and textile" One man exhibition, METALLUM, Stockholm
1992 Members Exhibition Metallum
1993 Exhibition at the "Konsthantverkshuset", Göteborg
1994 "18 jewellers"; Metallum at Krapprup Gallery, Skåne
1994 "Swedish Art School - 150 years", Jubilee-exhibition, METALLUM, Stockholm
1994 "10 x 10", Swedish-Finnish textile and metal exhibition, Västerås Konsthall
1994 One man exhibition at RISTA Gallery, Umeå, Sweden
1994 B. Sanitate and Pamela Wilson, METALLUM, Sweden
1995 Craftverket, "textiles, ceramics, glas, wood and metal..", Form/Design Center,Malmö
1995 "Ädla tendenser", Historical Museum and METALLUM
1995 Forsbergs Gallery, Härja, Tidaholm, Sweden
1996 "4 Swedish jewellers", Gallery Expo Arte, Oslo, Norway
1996 Orfevrerie et Bijou Contemporains 96, Les Musées de Cagnes-Sur-Mer, France
1996 "Koru. Artificuim Arte Artificium". Travelling exhibition to Rome, Helsinki, Stockholm, Odense (Denmark)
1996 "A matter of making", 20th anniversary exhibition at Canbarra School of Art Gallery, Canberra
1997 Triennale Internationale de Touranai, Belgium
Contemporary and ancient tapestries. Textile arts of the Nordic countries
1997 "Textile Jewellery" HIPOTESI, Barcelona
1997 "Crafts in the park", Rosendals Trädgård, Kulturhuvudstadsåret 1998, Stockholm
1999 "3 Dimensions", Swedish textile art exhibition, Museum of of Decorative Applied Art, Riga, Kaussas, Tartu (Latvia, Lithuania, Estonia).
1999 Form für schmuck und design, "me men to mori", travelling exhibition (Europe and UK)
2000 Sweden + USA contemporary jewellery and metalwork, Gallery Sculpture to Wear, Los Angeles

DRAFT

Application for Post Graduate study at the Canberra School of Art

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SWEDEN

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Background

I graduated from the textile workshop at Canberra School of Art in 1984 with a sub-major in silversmithing. Since then I have worked as a professional artist exhibiting in Australia, Europe, Scandinavia and USA (October 1999). I have been a member of a gold- and silversmithing group (METALLUM) since 1988 with our own gallery in Stockholm where I now live.

I am working both as a textile artist and jewellery artist. My pieces are created from a textile point of view, exploring textile techniques using traditional textile materials as well as paper, wood, platic and different metals.

In my jewellery making I have enjoyed finding alternative solutions and the restrictions of working on a loom. However, as I only have basic silversmithing skills I now find that my ability to express myself is becoming restricted. I therefore feel a need extend my self and be able to look at solutions from a gold- and silversmithing point of view.

Over the past 15 years I have seen a lot of interesting work made by graduates from the Canberra Gold- and Silversmithing workshop. I feel that to be given the opportunity to work in such an environment would be both stimulating and beneficial for my future development as an artist.

Aims of the proposal

I have the following aims for my research program:

- to raise the level of the metal work in my pieces but without losing my textile direction.
- to develop my skills as a jeweller
- to explore form and 3-D especially in my smaller pieces

The topic of the proposed study would be to explore the use of metal smithing in my textile work and jewellery. The nature of the study would be assemblage, "finishing off" and forming of pieces. The outcome would be well finished and functional objects made with the most suitable/harmonious materials through combining new skills with past experience in the field of textile.

The way the proposal relates to my prior practise and experience is that it would, instead of using only textile construction, give freedom to construct in metal and other associated materials

Methods and resources

1. Development of basic skills in various metal techniques, such as

- bending, pleating, turning and layering (maybe not raising so much) but shaping on a small scale
- joining and soldering metals and/or other materials (e.g stones, woods, plastic)
- incorporating pins and locks and other ways of attaching to the body and cloths
- surfaces, (brushing, polishing, colouring)

I will develop expertise in combining new skills to produce well finished and functional body pieces. I see no need for any specific resources apart from what is available in the workshop and an area for working on a small table loom at some stage during the study period.

2. My approach

Growing up in a Botanical Gardens in Northern Queensland and from an early age being exposed to and facinated by the great diveristy in plant- and marine life I developed a strong feeling towards natural forms, structures and colour. This gave me an interest in making jewellery. Moving to Sweden, with it´s long and strong tradition in textiles, woke my interest in weaving. However, being an Australian I feel free from the hidden boundaries of tradition but at the same time I still have a great appreciation of the craftmenship handed down through the generations.

When studying for my Undergraduate Degree at the Canberra School of Art I started to combine my interest for jewellery with weaving and I believe that these two influences have given me a different way of approaching the creation of body ornaments compared to other jewellery artists.

Context

1. There is a long tradition in combining textile and metals and it now seems that once again is becoming more accepted and widely used.
2. I have noticed over the last 10 years that some jewellers in Europe, Japan and Scandinavia are incorporating textiles in their work.

3. Another development is that the gap between art, design, engineering and science is narrowing which can be seen in;

- revolutionary fabrics using new tecnology seen in industry and contemporary textiles
- new esthetics, for example metals are being combined with textile techniques to provide versatile fabric structures
- advanced technology to investigate new materials and technique. In Japan, Jun´ichi Arai, co-founder of Nuno fabrics and Issy Miyake, create unique garments which are beautiful, practical and totally wearable.
- hybrid materials replace heavier materials, some part textile (flexible), part non-textile (e.g glas, carbon, metal and ceramic)
- composites (the combination of two or more materials) that differ in form or compositon to create new materials.

My proposed study has both a historical connection and at the same time I feel it is very important to be part of the latest developments within jewellery making and textiles.